

Using Dummy IPv4 Address and Node Identification Extensions for IP/ICMP translators

[draft-equinox-v6ops-icmpext-xlat-v6only-source](#)

(was: [draft-equinox-intarea-icmpext-xlat-source](#))

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Problem Statement

Dual-stack INTERNET

ICMPv4
src: 198.51.100.1

NAT64 (PLAT), prefix 64:ff9b::/96

IPV6-Only Network

ICMPv6
src: 64:ff9b::198.51.100.1

ICMPv6
src: 2001:db8:a::a

IPv6-only host, running CLAT, prefix 64:ff9b::/96

ICMPv4, src: 198.51.100.1

ICMPv4, src: ????????

problem!

Operational Issues

- Traceroute does not represent IPv6-only hops
 - Confused users
 - Unhappy NOC
- ICMPv6 Packet Too Big are not translated
 - Broken PMTUD

Proposed Solution

Terminology: Untranslatable

- “Untranslatable” IPv6 address:
 - doesn't belong to NAT64 prefix
 - there is no explicit address mapping

ICMPv6 -> ICMPv4 Translation

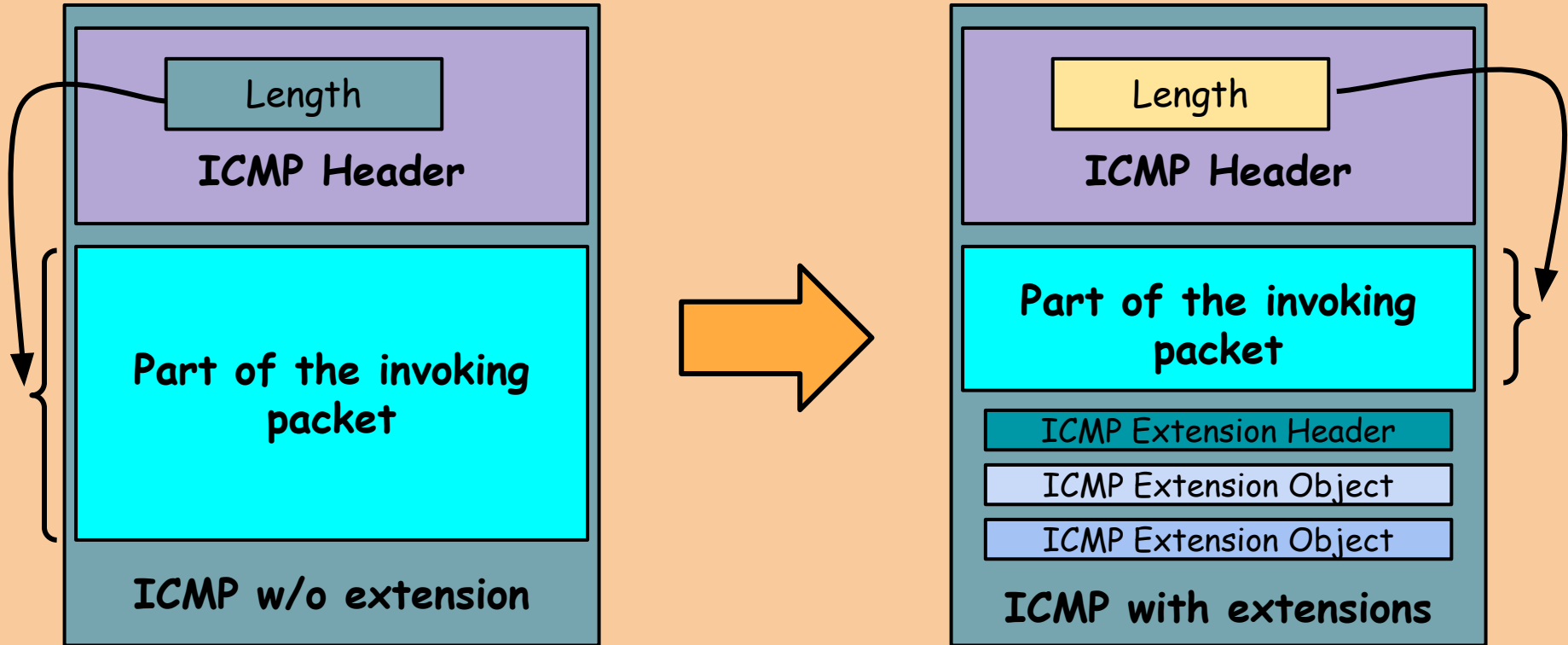
1. Define how to translate "untranslatable" IPv6 addresses
2. Preserve information about the original IPv6 address

Translating the Untranslatable

Whenever a translator translates an ICMPv6 Destination Unreachable, ICMPv6 Time Exceeded or ICMPv6 Packet Too Big ([RFC4443]) to the corresponding ICMPv4 ([RFC0792]) message, and the IPv6 source address in the outermost IPv6 header is an untranslatable one, the translator SHOULD use the dummy IPv4 address (192.0.0.8) as IPv4 source address for the translated packet.

| Address Block | Name | RFC | Allocation Date | Termination Date | Source Destination Forwardable | | | Globally Reachable | Reserved-by-Protocol |
|------------------|--------------------------------|------------------------|-----------------|------------------|--------------------------------|-------|-------|--------------------|----------------------|
| 192.0.0.0/24 [2] | IETF Protocol Assignments | [RFC6890], Section 2.1 | 2010-01 | N/A | False | False | False | False | False |
| 192.0.0.0/29 | IPv4 Service Continuity Prefix | [RFC7335] | 2011-06 | N/A | True | True | True | False | False |
| 192.0.0.8/32 | IPv4 dummy address | [RFC7600] | 2015-03 | N/A | True | False | False | False | False |

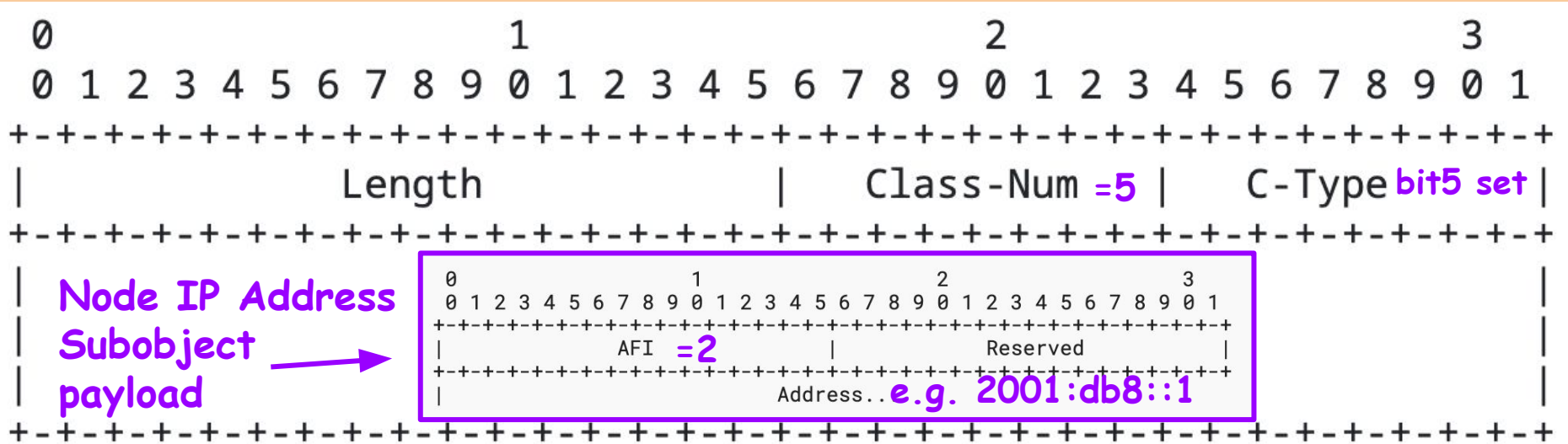
Quick Recap: ICMP Extensions (RFC4884)



Preserving the Original IPv6 Source Address

Node Identification Object

Node IP Address Sub-Object



[draft-ietf-intarea-extended-icmp-nodeid](#)

Adding the Node Identification Object

4.2. Adding Node Identification Extension Object

A Node Identification Extension Object SHOULD be added when translating:

- ICMPv6 Destination Unreachable to ICMPv4 Destination Unreachable
- ICMPv6 Time Exceeded to ICMPv4 Time Exceeded.
- ICMPv6 Packet Too Big to ICMPv4 Destination Unreachable.

and the IPv6 source address in the outermost IPv6 header is untranslatable.

When adding the Node Identification Extension Object, the translator MUST include the IP Address Sub-Object containing the original IPv6 source address of the packet.

Please Read the Draft

- Details on the translator behaviour:
 - adding new Extension Structure
 - appending extension object to existing structure
- Updates to RFC7915 (translation algorithm):
 - "When translating ICMPv4 -> ICMPv6, follow recommendations in draft-equinox-v6ops-icmpext-xlat-v6only-source"

Open Issues

- Current text contains many implementation details:
 - When to add an extension object, before or after the translation?
 - Before: easier to translate
 - After: can be added when ICMPv6 PTB is translated to ICMPv4 "Fragmentation Needed"
- Are we over specifying?
 - Maybe just define how the packet must look like?

Next Steps

- Is this problem worth solving?
- Comments? Suggestions?
- **Adoption?**